



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/656,821	09/05/2003	Michael Paul Tankard	K315.131.101	9414
25281	7590	09/08/2005		
DICKE, BILLIG & CZAJA, P.L.L.C. FIFTH STREET TOWERS 100 SOUTH FIFTH STREET, SUITE 2250 MINNEAPOLIS, MN 55402			EXAMINER MCCLOUD, RENATA D	
			ART UNIT	PAPER NUMBER
			2837	

DATE MAILED: 09/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/656,821

Applicant(s)

TANKARD, MICHAEL PAUL

Examiner

Renata McCloud

Art Unit

2837

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 July 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1,4-6,8,11 are rejected under 35 U.S.C. 102(b) as being anticipated by Starkie et al (US 6329785).

Claim 1: a circuit comprising a plurality of switches (Fig. 3: 25,23) connecting a phase winding (15) to a supply (13), the switches comprising a first set (25) and a second set (23) for supplying current to the phase winding and returning current to the supply, the switches of the first and second set conducting current in both a first and a second direction (col. 3:52-56, the switches are bidirectional) and the switches of the first set (25) being rated higher than the switches of the second set (col. 2:64-66).

Claim 4: the switches (25,23) are capable of operating as a diode (col.1: 51-56; also, the switches are capable of operating as a diode, as it has been held that the recitation that an element is “capable of” performing a function is not a positive limitation but only requires the ability to so perform. It does not constitute a limitation in any patentable sense. In re Hutchinson, 69 USPQ 138).

Claim 5: a switch has an inherent integral reverse diode (col.1: 51-56).

Claims 6, 11: the switches are MOSFETs (col. 5:27-30).

Claim 8: there are four switches (23,25) and the first set (25) comprises two switches (25) rated higher than the remaining two forming a second set (col. 2:64-66).

3. Claim 14 is rejected under 35 U.S.C. 102(b) as being anticipated by Young et al (US 5838127).

Claim 14: an SR motor comprising a plurality of rotor poles, a stator having a plurality of stator poles (col. 4:48-66) and a circuit comprising a plurality of switches (Fig. 2: 148,150,152,154) connecting a phase winding (138) to a supply (P), the switches comprising a first set (148/154) and a second set (152/150) for supplying current to the phase winding and returning current to the supply, the circuit is arranged during a motoring mode to supply current to the phase windings via the first set and provide a path for returning current to the supply via the second set, and in a generator mode to supply current to the phase winding via the second set and return current to the supply via the first set (Col. 2:63-67; 6:18-33; 8:1-12)

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-13,15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Young et al in view of Starkie et al.

Claim 1: Young et al teach a circuit comprising a plurality of switches (Fig. 2:148,150,152,154) connecting a phase winding (138) to a supply (P), the switches comprising a first set (148/154) and a second set (150/152) for supplying current to the phase winding and returning current to the supply, the switches of the first and second set conducting current in both a first and a second direction (col. 5:48-50 MOSFETS are bidirectional). They do not teach the switches of the first set being rated higher than the switches of the second set. Starkie et al teach switches of the first set (25) being rated higher than the switches of the second set (col. 2:64-66). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus taught by Young et al to rate the switches as taught by Starkie et al in order to provide overcurrent protection.

Claim 2: Young et al and Starkie et al teach the limitations of claim 1. Referring to claim 2, Young et al teach the circuit is arranged during a motoring (forward) mode to supply current to the phase windings via the first set and provide a path for returning current to the supply via the second set, and in a generator (reverse) mode to supply current to the phase winding via the second set and return current to the supply via the first set (Col. 2:63-67; 6:18-33; 8:1-12)

Claims 3 and 13: Young et al and Starkie et al teach the limitations of claims 1 and 12. Referring to claims 3 and 13, Young et al teach the direction of the current in

the phase winding in the motor mode (forward) is opposite the direction in the generator mode (Col. 2:63-67; 6:18-33; 8:1-12: reverse).

Claim 4: Young et al and Starkie et al teach the limitations of claim 1. Referring to claim 4, Starkie et al teach the switches (25,23) are capable of operating as a diode (col.1: 51-56). Young et al also teach that the switches are capable of operating as a diode (col. 5:48-50 MOSFETS). Also, as it has been held that the recitation that an element is "capable of" performing a function is not a positive limitation but only requires the ability to so perform. It does not constitute a limitation in any patentable sense. In re Hutchinson, 69 USPQ 138).

Claim 5: Young et al and Starkie et al teach the limitations of claim 1. Referring to claim 5, Starkie et al teach a switch has an inherent integral reverse diode (col.1: 51-56).

Claims 6, 11: Young et al and Starkie et al teach the limitations of claim 1. Referring to claims 6,7,11, Starkie et al teach the switches are MOSFETs (col. 5:27-30).

Claim 7: Young et al and Starkie et al teach the limitations of claim 1. Referring to claim 7, they teach the claimed invention except for enhancement layer MOSFETs. It would have been an obvious matter of design choice to use enhancement layer MOSFETs, since applicant has not disclosed that using enhancement layer MOSFETs solves any stated problem or is for any particular purpose and it appears that the invention would perform equally well with MOSFETs.

Claim 8: Young et al and Starkie et al teach the limitations of claim 1. Referring to claims 6,7,11, Starkie et al there are four switches (23,25) and the first set (25)

comprises two switches (25) rated higher than the remaining two forming a second set (col. 2:64-66).

Claim 9: Young et al and Starkie et al teach the limitations of claim 1. Referring to claim 9, Young et al teach a first switch (148) connected between a first end of the winding (138) and a first voltage rail (P+), a second switch (152) connected between the first end of the winding (138) and a second voltage rail (P-), a third switch (150) between a second end of the winding (138) and the first voltage rail (P+), and a fourth switch (154) connected between the second end and the second rail the first (148) and fourth (154) switches forming a set.

Claim 10: Young et al and Starkie et al teach the limitations of claim 9. Referring to claim 10, Young et al teach the second (150) and third switches (152) form the second set.

Claims 12 and 15: Young et al teach a SR motor comprising a plurality of rotor poles, a stator having a plurality of stator poles (col. 4:48-66) and a circuit comprising a plurality of switches (Fig. 2: 148,150,152,154) connecting a phase winding (138) to a supply (P), the switches comprising a first set (148/154) and a second set (152/150) for supplying current to the phase winding and returning current to the supply, the circuit is arranged during a motoring mode to supply current to the phase windings via the first set and provide a path for returning current to the supply via the second set, and in a generator mode to supply current to the phase winding via the second set and return current to the supply via the first set (Col. 2:63-67; 6:18-33; 8:1-12). They do not teach the switches of the first set being rated higher than the switches of the second set.

Art Unit: 2837

Starkie et al teach switches of the first set (25) being rated higher than the switches of the second set (col. 2:64-66). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus taught by Young et al to rate the switches as taught by Starkie et al in order to provide overcurrent protection.

6. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Starkie et al.

Claim 7: Starkie et al teach the limitations of claim 1. Referring to claim 7, they teach the claimed invention except for enhancement layer MOSFETs. It would have been an obvious matter of design choice to use enhancement layer MOSFETs, since applicant has not disclosed that using enhancement layer MOSFETs solves any stated problem or is for any particular purpose and it appears that the invention would perform equally well with MOSFETs.

Response to Arguments

7. Applicant's arguments with respect to claims 1-15 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

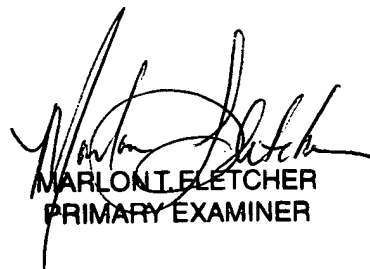
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Renata McCloud whose telephone number is (571) 272-2069. The examiner can normally be reached on Mon.- Fri. from 8 am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Martin can be reached on (571) 272-2800 ext. 4. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Renata McCloud
Examiner
Art Unit 2837

RDM


MARLON T. FLETCHER
PRIMARY EXAMINER